

### Abstract

A simple and flexible WDM laser source is disclosed using a loop erbium-doped fiber amplifier (LEDFA) configuration. The loop serves as a mirror and as an  
5 amplification medium. The laser cavity was made from the loop mirror and a set of fiber Bragg gratings (FBGs) which select the proper lasing wavelengths. The FBGs can be placed either in parallel or in series at the output of the loop configuration. Optical attenuators are placed in front of the FBG to control the flatness of the laser source output and determine the required lasing condition for each wavelength to avoid competition of  
10 the different lasing wavelengths. This configuration is flexible for adding any number of wavelengths as long as enough amplified spontaneous emission (ASE) is generated in the loop. Signal to noise ratio as high as 55-dB can be achieved.